REMARKS

In response to the Office Action mailed October 17, 2007, Applicant respectfully requests reconsideration. Claims 27-52 were previously pending in this application. By this amendment, claims 27, 37 and 50 have been amended. Claims 51 and 52 have been canceled without prejudice or declaimer. As a result, claims 27-50 are pending for examination with claims 27 and 50 being independent. No new matter has been added.

Allowable Subject Matter

As a preliminary matter, Applicant thanks the Examiner for the indication of allowable subject matter in claims 28 and 44-46.

Rejections Under 35 U.S.C. §103

The Office Action rejected claims 27, 30, 31, 32, 34, 39, 40, 42, 47, 49, 50 under 35 U.S.C. 103(a) as being unpatentable over Kim, International Application No. WO 00/77961 ("Kim") in view of Dölle et al., U.S. Patent No. 6,674,817 (Dölle), and further in view of Serfaty, U.S. Patent No. 5,293,401 ("Serfaty"). Applicant respectfully disagrees. In addition, Applicant has amended independent claims 27 and 50 to more clearly distinguish over the cited references.

A.   Independent Claim 27

Claim 27, as amended, recites:

A receiver for receiving a signal comprising a modulated carrier, with a frame having a first and second training sequences, comprising:
a frequency offset estimation unit for receiving the signal and obtaining initial information relating to a carrier frequency offset from an autocorrelation signal obtained by autocorrelation of the first training sequence of the received signal and for obtaining an estimate of the carrier frequency offset from the initial information and an autocorrelation signal obtained by autocorrelation of the second training sequence of the received signal, wherein:
the initial information comprises a sign of the carrier frequency offset,
the second training sequence is longer than the first training sequence, and

> the autocorrelation of the second training sequence uses more samples
> than the autocorrelation of the first training sequence;
>
> a frequency offset compensation unit for compensating the received signal
> with the frequency offset obtained from the frequency offset estimation unit to
> form a compensated received signal, and
>
> a time reference determining unit for obtaining a timing reference for the
> received signal by cross-correlation of the compensated received signal with a
> known training sequence.
>
> (Emphasis added).

On page 4, the Office Action concedes that Kim and Dölle do not teach a frame with two training sequences. On page 5, the Office Action states Serfaty teaches a frame having first training sequence and second training sequence in Fig. 2; Fig. 7 (elements TR1 and TR2); col. 1, lines 52-68; col. 2, lines 1-2; col. 3, lines 45-49.

Serfaty is directed to an equalizer for equalization of a linear modulated signal received in blocks or frames over a radio channel. (Serfaty, Abstract). Serfaty discusses that an equalizer is provided for equalising a linear modulated signal, containing periodic predetermined sequences for training, received over a radio channel, comprising: means for receiving a first training sequence and estimating the impulse response of the channel during receipt of the first training sequence; ... means for receiving a second training sequence following said samples and estimating the impulse response of the channel during receipt of the second training sequence. (Serfaty, col. 1, lines 52-62). Further, Serfaty discusses that *the training sequence received before and after the frame* are used in setting the co-efficients for equalization of the frame. (Serfaty, col. 2, lines 3-5). The training sequences received before and after the frame are different from a frame with two training sequences.

Also, Serfaty discusses that "the transmitter (not shown) will be assumed to transmit frames of data having a structure shown in FIG. 2, with blocks of 45 symbols of data (N=45) and 9 symbols for training." (Serfaty, col. 3, lines 45-48). Fig. 2 of Serfaty clearly shows that the frame comprises blocks of 45 symbols of data and 9 symbols for training denoted as TR1. Therefore, Serfaty describes a frame with one training sequence. In contrast, claim 27 teaches a frame having a first and second training sequences.

Furthermore, claim 27 has been amended to further distinguish over the cited references. Support for the amendment can be found, for example, on pages 13-14 of the present specification. Serfaty does not teach or suggest "a frequency offset estimation unit for

receiving the signal and obtaining initial information relating to a carrier frequency offset from an autocorrelation signal obtained by autocorrelation of the first training sequence of the received signal and for obtaining an estimate of the carrier frequency offset from the initial information and an autocorrelation signal obtained by autocorrelation of the second training sequence of the received signal, wherein: the initial information comprises a sign of the carrier frequency offset, the second training sequence is longer than the first training sequence, and the autocorrelation of the second training sequence uses more samples than the autocorrelation of the first training sequence," as recited in claim 27.

On page 5, The Office Action alleges that "it would have been obvious to replace the frames of Kim and Dölle by Serfaty frames which have first and second training sequences in order to separate data and decode the received signals as they are transmitted as taught by Serfaty." As discussed above, Serfaty does not teach a frame having a first and second training sequences. Since Serfaty does not teach or suggest a frame having a first and second training sequences, as alleged in the Office Action, the Office Action has not set forth *a prima facie* case of obviousness, as set forth in MPEP §2143.

Therefore, claim 27 patentably distinguishes over Kim, Dölle and Serfaty, either alone or in combination.

Claims 28-49 depend from claim 1 and are allowable for at least the same reasons.

Accordingly, withdrawal of the rejection of claims 27-49 is respectfully requested.

B.   Independent Claim 50

Claim 50, as amended, recites:

> A method for processing a received signal comprising a modulated carrier having a frame with a first and second training sequences, comprising:
> *obtaining initial information relating to a carrier frequency offset from an autocorrelation signal obtained by autocorrelation of the first training sequence of the received signal, wherein:*
> *the initial information comprises a sign of the carrier frequency offset,*
> *the second training sequence is longer than the first training sequence,* and
> *the autocorrelation of the second training sequence uses more samples than the autocorrelation of the first training sequence;*
> obtaining an estimate of the carrier frequency offset from the initial information and an autocorrelation signal obtained by autocorrelation of the second training sequence of the received signal;

compensating the received signal with the obtained estimate of the
frequency offset to form a compensated received signal, and
obtaining a timing reference for the received signal by cross-correlation of
the compensated received signal with a known training sequence.
(Emphasis added).

On page 6, the Office Action states that "claim 50 is rejected under the same rationale
as mentioned in the rejection of claim." Claim 50 has been amended to further distinguish
over the cited references. Support for the amendment can be found, for example, on pages
13-14 of the present specification.

As discussed above, Serfaty does not teach or suggest "a frame with a first and second
training sequences," as recited in claim 50. Furthermore, Serfaty does not teach or suggest
"obtaining initial information relating to a sign of a carrier frequency offset from an
autocorrelation signal obtained by autocorrelation of the first training sequence of the
received signal, wherein: the initial information comprises a sign of the carrier frequency
offset, the second training sequence is longer than the first training sequence, and the
autocorrelation of the second training sequence uses more samples than the autocorrelation
of the first training sequence," as recited in claim 50.

Therefore, claim 50 patentably distinguishes over Kim, Dölle, and Serfaty, either alone or
in combination.

Accordingly, withdrawal of the rejection of claim 50 is requested.

CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Dated: February 19, 2008   Respectfully submitted,

                                        By: /James H. Morris/
                                               James H. Morris, Reg. No. 34,681
                                               Wolf, Greenfield & Sacks, P.C.
                                               600 Atlantic Avenue
                                               Boston, Massachusetts 02210-2206
                                               Telephone: (617) 646-8000